

TI 83-84: Solving Equations By Graphing On Your Calculator

Important: Solving by graphing on your calculator gives a decimal answer, not an "exact" answer. So if the answer is really $\sqrt{2}$, the calculator will tell you that the answer is 1.414...

Method 1: Graph each side of the equation as separate "y =" equation, look for the intersection of the graphs -- the x-coordinate of any intersection is a solution. (See Worksheet 5 for directions on finding intersections.) Make sure that you only list x-values as solutions...there were no y-values in the original equation.

Method 2: Get a zero on one side of the equation, then graph the other side on your calculator. Look for the x-intercepts -- these will be the solutions. (See Worksheet 6 for directions on finding x-intercepts.) Make sure that you only list x-values as solutions...there were no y-values in the original equation.

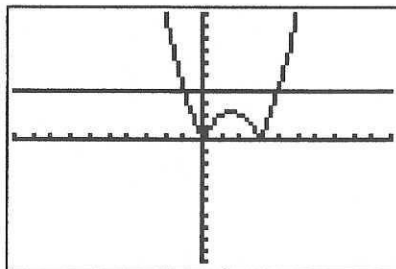
Here's an example using Method 1:

Solve this equation by graphing:

$$|3x - x^2| = 4$$

graph each side as a separate equation:

```
Plot1 Plot2 Plot3
\Y1=abs(3X-X^2)
\Y2=4
\Y3=
\Y4=
```



Find the two intersections by using 2^{nd} CALC intersect: $x = -1$ and $x = 4$ are solutions to this equation.

Can you check that by substituting those answers for x in the equation? Try it!

$$|3x - x^2| = 4$$

$$\text{let } x = -1$$

$$|3(-1) - (-1)^2| \stackrel{?}{=} 4$$

then what?

$$|-3 - 1| \stackrel{?}{=} 4$$

$$|-4| \stackrel{?}{=} 4$$

$$4 = 4 \checkmark$$

$$|3x - x^2| = 4$$

$$\text{let } x = 4$$

$$|3(4) - (4)^2| \stackrel{?}{=} 4$$

$$|12 - 16| \stackrel{?}{=} 4$$

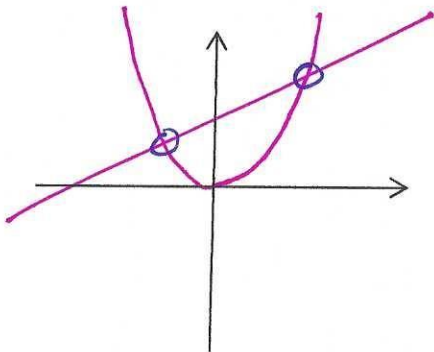
$$|-4| \stackrel{?}{=} 4$$

$$4 = 4 \checkmark$$

Practice for Solving Equations By Graphing

- Solve each equation by graphing both sides of the equation as separate functions on your calculator. **ZOOM** Standard works well.
- Sketch the graphs below, then ask your calculator for the exact intersections, using **2nd** **CALC** **intersect**.
- Remember that we only want the x-values, because we're solving equations with just x!
- *Answers are at the bottom of the page.*

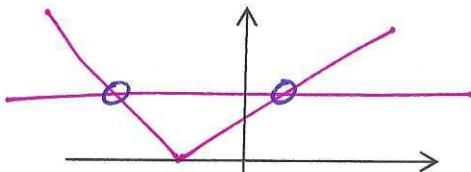
(1) $x^2 = x + 6$



2nd CALC intersect?

$$x = -2, 3$$

(2) $|x+2|=3$

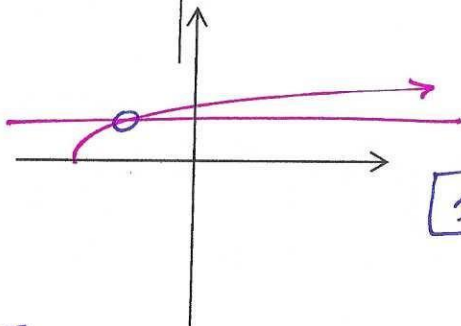


$$x = -5, 1$$

Wait... where's absolute value?

MATH
right arrow to **NUM**
choice #1.

(3) $\sqrt{x+7} = 2$



$$x = -3$$

OR

it's the first thing in the catalog.

2nd **CATALOG**
(above zero)

↗
#3 $\sqrt{x+7} = 2$

(1) $x = -2, 3$ (2) $x = -5, 1$ (3) $x = -3$